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February 1, 2007

**VIA EFS**

**(Total No. of Pages Transmitted: 9)**

To: Examiner Ngo, C.  
Group Art Unit No. 2193

From: Frederick E. Cooperrider

Facsimile No.: (703) 761-2375 or 76

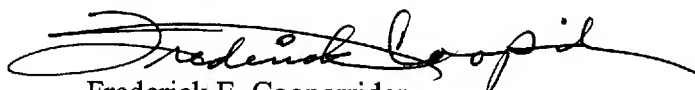
Re: Statement of Substance of Interview  
U.S. Patent Application Serial No. 10/671,887  
Attorney Docket No. YOR920030010US1 (YOR.424)

Examiner Ngo:

Thank you for taking time today for a telephone interview involving the above-identified Application. Enclosed is a Statement of Substance of Interview, which we request be made of record, for this telephone interview.

Thank you in advance for your kind consideration on this case.

Very truly yours,



Frederick E. Cooperrider  
Registration No. 36,769

FEC/fec  
Enclosure 8 pages

S/N: 10/671,887  
Docket: YOR920030010US1 (YOR.424)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of

Gustavson, et al.

Serial No.: 10/671,887

Group Art Unit: 2193

Filed: September 29, 2003

Examiner: Ngo, C. D.

For: METHOD AND STRUCTURE FOR PRODUCING HIGH PERFORMANCE LINEAR  
ALGEGRA ROUTINES USING COMPOSITE BLOCKING BASED ON L1 CACHE  
SIZE

Honorable Commissioner of Patents  
Alexandria, Virginia 22313-1450

**STATEMENT OF SUBSTANCE OF INTERVIEW**

Sir:

In response to the requirement in 37 C.F.R. §1.2, 37 C.F.R. §1.133, and MPEP §713.04, that Applicants provide a statement of the substance of an interview, Applicants hereby submit the following summary.

Applicants gratefully acknowledge Examiner Ngo for taking time from his busy schedule to conduct a telephone interview on February 1, 2007, for the above-referenced Application. The interview was courteous and professional, and it is believed by Applicants' representative that prosecution has been advanced because of this interview.

Concerning the substance of the interview, co-inventor Gustavson presented a brief summary of the present invention, as described on the attached presentation materials, including a comparison with the cited prior art.

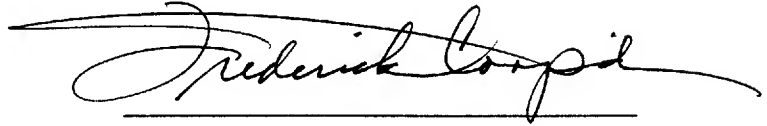
S/N: 10/671,887

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The Examiner indicated appreciation for the presentation and agreed to consider its contents in the evaluation of Applicants' next response.

Respectfully submitted,

Date: 2/01/07

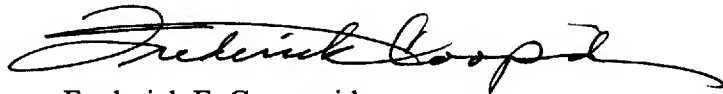


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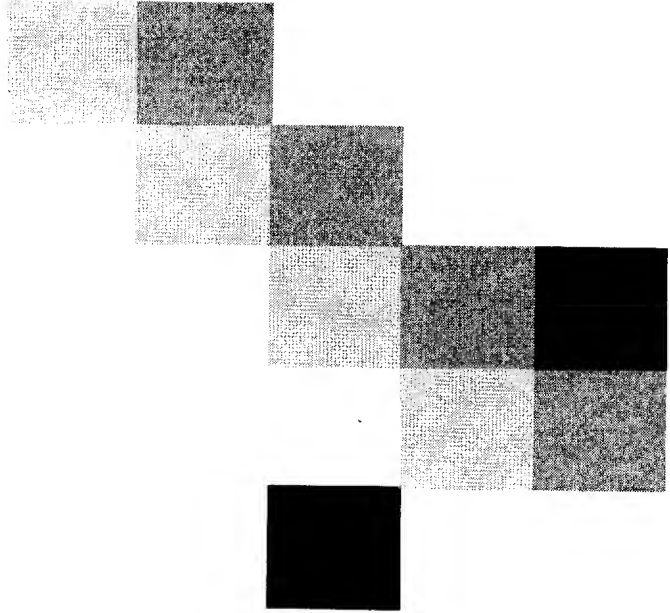
CERTIFICATION OF TRANSMISSION

I certify that I transmitted electronically, via EFS, this Statement of Substance of Interview to Examiner Ngo on February 1, 2007.



Frederick E. Cooperrider  
Reg. No. 36,769

Attachments: Presentation materials (6 pages)



# Patent Application 10/671,887

Fred Gustavson  
IBM Research  
February 1, 2007

# Overview of Talk

- Myszewski and Patent Composite Blocking (CB) is an Apples to Oranges Comparison
- Mys. is concerned with standard cache blocking
- CB is concerned with non-standard cache blocking

# Ideas of Composite Blocking

- Uses Square Block Format
  - a SB can be larger than L1 cache
  - contiguous blocks map best into a L1 cache
  - square is a Union of rectangles
- each rectangle fits into L1 cache
- CB supported by L3 BLAS & factor kernels
- SB format is a non-standard format

# Use of CB for Cholesky Factor

- can translate simple Cholesky scalar code easily into CB sub-matrix code
  - use sub-matrix partitioning as does LAPACK
  - scalar operations become L3 BLAS calls
  - use L3 BLAS on rectangular sub-blocks of a simple SB
- CB gave optimal perf. on a Power 3
  - 92% (CB) vs. 75% (LAPACK) of peak

# Notes on Myszewski Patent

- Standard cache blocking first used in 1986
  - ESSL released in 2/86
  - used selective data copy
- Mys of 1992 uses standard cache blocking
  - does NOT use data copy
  - examine attached code of Mys.
  - Mys. must use standard data formats



# Summary of CB vs. Mys.

- CB only works on non-standard formats
  - SB is Union of rectangles: larger than L1
  - each rectangle fits into L1
  - rectangles are best for DGEMM
- Mys. uses standard cache blocking
  - only uses standard matrix layout
  - does NOT use data copy
- Applies to Oranges comparison